

PATENT SPECIFICATION

DRAWINGS ATTACHED



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847388

Date of filing Complete Specification: Oct. 22, 1958.

Application Date: Aug. 12, 1957.

No. 25373/57.

Complete Specification Published: Sept. 7, 1960.

Index at acceptance:—Class 89(3), C(4:5).

International Classification:—B25c.

COMPLETE SPECIFICATION

Improvements in or relating to Stapling Appliances

We, GRYPMAK LIMITED, a British Company of Britannia Works, 28, Ashton Road, Luton, Bedfordshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to stapling appliance, particularly of the industrial type. Industrial stapling appliances are frequently employed in the furniture and allied trades where it is often necessary to drive staples at locations which can only be reached with difficulty. In such locations, a pointed ejector nozzle facilitates operation of the appliance, but, even so, proper operation may be hindered by a staple magazine which projects from the nozzle and which may foul objects in the vicinity of the point at which the staple is to be driven. In such circumstances, it may be necessary to hold the appliance at an awkward angle to avoid the obstructing objects, to the detriment of the stapling operation.

To minimise this difficulty, the present invention provides a stapling appliance having a handle part, a staple driveway and a staple magazine projecting transversely of the driveway, wherein the said magazine is arranged for angular adjustment about the direction of staple ejection and relatively to the said handle part. The magazine may then be set at the start of an operation to avoid obstructing objects so that staples can be driven while the appliance is held in the hand in a convenient position.

The invention also provides a staple magazine which can be refilled with staples from the end distant from the ejecting mechanism, thereby reducing to a minimum the time wasted in refilling.

The invention will be more readily understood by way of example from the following description of a stapling appliance in accordance therewith, reference being made to the drawings accompanying the provisional specification, in which:—

[Price 3s. 6d.]

Figure 1 is a side view, partly in section of appliance, and

Figure 2 is a side view of the magazine, with the cover plate removed.

Referring to Figure 1, the stapling appliance is of pistol form and has a handle 12 designed to be gripped in the hand in the fashion of a pistol butt. In the upper part of the handle there is formed a cylindrical hole 13 to receive the staple driving mechanism which is operated by compressed air supplied through a passage 14 in the handle 12 and controlled by a valve 15 operated by a trigger 16. A vent passage 17 is also provided in the handle 12.

The staple driving mechanism includes a generally cylindrical cover tube 18 which is cut away at its rear end to form a part 20 of reduced diameter and a shoulder 21. The part 20 is a close fit within hole 13, the shoulder 21 abutting against the forward end of the handle 12. The tube 18 is held in position by an end cap 22 which is screwed on to the threaded end of the part 20 until it engages the rear end of the handle 12.

The forward end of tube 18 is internally threaded at 23 and receives an externally threaded front end-cap 24, locked in position by a lock nut 25 which is screwed up until it engages the forward end of tube 18. The front end-cap 24 is integral with an elongate structure 26 which contains a length-wise staple driveway 40 (Figure 2) extending from the forward end of the structure 26 and through the front end-cap 24. A staple drive-blade 27 is located in the driveway and when in its most forward position extends to the forward end of the driveway. The rear end of blade 27 passes through the front end-cap 24 and is attached by a pin 28 to two segments 28a which are a press-fit within a hollow piston 29. Piston 29 is slidable within tube 18 and has on its exterior annular inserts 31 forming an air-tight seal between the piston 29 and the interior of tube 18. The interior of the tube

Price 2s.

18 is reduced in diameter at the forward end by a tubular insert 32 within which is located a compression spring 33. This spring is mounted round blade 27 and abuts at its forward end against a plate 34 attached to end cap 24 and at the rear end against a disc 35 secured to the blade 27.

Figure 1 shows the piston 32 in its most forward position which it takes after the ejection of a staple. Normally, the piston 32 is driven by the spring 33 to the rear end of the tube 18. On operation of trigger 16, valve 15 is opened to allow compressed air to pass into a tubular passage 36 between the part 20 and the handle and from thence to the interior of the tube 20 at the rear of piston 29 through milled apertures (not shown) in the threaded part of cap 22. The piston is driven forward against the action of spring 33, until it is stopped by engagement with insert 32, thereby causing the ejection of any staple in the drive-way. On subsequent release of trigger 16, the valve 15 returns to its normal position and puts the interior of tube 20 into communication with vent passage 17 so that the spring 33 can return the piston to its initial position, ready for the next stapling operation.

A large capacity staple magazine 37 is attached to structure 26. This magazine is of necessity of considerable length, and when the stapling appliance is in use, may make it difficult to apply the nose of the structure 26 to locations which have obstructing objects nearby, unless the appliance is held at an awkward angle. In order that the magazine may be set to avoid the obstructing objects, the tube 18 with the structure 26 and magazine 37 is rotatable so that the magazine may be adjusted relative to the handle 12, about the direction of staple ejection, i.e. the longitudinal direction of the driveway 26. To adjust the tube 18 in this way, the rear end-cap 22 is slackened off, thereby permitting the tube to turn in hole 13. When the magazine 37 has been moved to the desired position relative to handle 12, the tube 18 is locked in position again by end-cap 22. As the passage 36 extends right round part 20, the staple ejection mechanism operates in satisfactory manner irrespective of its angular position in the handle 12.

Alternatively, the magazine may be adjusted by loosening lock nut 25 and turning the forward end-cap 24 in tube 18 until the desired angular position relative to handle 12 is reached.

The magazine 37 is shown in greater detail in Figure 2 and incorporates a chamber 41 into which a bank of staples is loaded. The structure 26 is provided with an opening permitting the topmost staple in the magazine to pass from chamber 41 into the guide way 40, and the chamber 41 extends downwardly to an opening at the bottom of the magazine.

The staples in chamber 41 are urged upwardly by a pusher 42 which has on each side a pin 43 projecting through a slot 44 in the sides of the magazine cover and which is attached to one end of a tension spring 45 which passes over a wheel 46 and is attached at the other end to the magazine cover at 47. The pin 43 has secured to it relatively large knobs 43a located outside the magazine cover and enabling the pusher to be manually moved along the slot 44. As shown in Figure 2, the slot 44 is parallel to the edge of the magazine for the major part of its length, but at the lower end has a part 48 extending sideways for a short distance. This sideways extending part 48 permits the pusher 42 to be moved sideways out of the chamber 41, thereby allowing a fresh bank of staples to be introduced into the chamber 41 from the lower end without the necessity of removing any part of the magazine. This arrangement of the pusher 42 reduces to a minimum the time required to replenish the magazine, when all the staples therein have been fired.

WHAT WE CLAIM IS:—

1. A stapling appliance having a handle part, a staple driveway and a staple magazine projecting transversely of the driveway, wherein the said magazine is arranged for angular adjustment about the direction of staple ejection and relatively to the said handle part.

2. A stapling appliance as claimed in Claim 1 wherein the handle part also projects transversely to the staple driveway.

3. A stapling appliance as claimed in Claim 2 wherein the driveway and magazine form parts of a staple ejection mechanism which is mounted in the handle part for relative angular adjustment about the direction of staple ejection.

4. A stapling appliance as claimed in Claim 2 wherein a staple ejection mechanism is mounted on the handle part and is arranged forcibly to drive an ejection blade along the staple driveway which is formed in a structure which is attached to the mechanism and is angularly adjustable relative to the handle, the staple magazine being carried by the said driveway structure and being operative to supply staples to the driveway.

5. A stapling appliance according to Claim 4 in which the ejection mechanism is rotatably mounted in the handle for angular adjustment relative to the handle about the direction of staple ejection,

6. A stapling appliance according to Claim 5 in which the blade projects into the ejection mechanism and is rotatable therewith.

7. A stapling appliance according to Claim 5 or Claim 6 in which the ejection mechanism includes a tubular member closed by an end cap secured to the driveway structure and angularly adjustable relative to the tubular member about the direction of staple ejection.

8. A stapling appliance according to Claim

7 in which the ejection mechanism comprises a piston slidably arranged in the tubular member and connected to the blade so as to operate the blade when fluid under pressure is supplied to the tubular member.

9. A stapling appliance according to Claim 7 or Claim 8 in which the tubular member is angularly adjustable within the handle about the direction of staple ejection.

10. A stapling appliance according to any of the preceding claims in which the magazine is arranged to be refilled from the end distance from the driveway.

11. A stapling appliance according to Claim 10 in which the magazine has a passage

adapted to receive a supply of staples for the appliance and extending at one end to the driveway and at the other end to an opening, and a pusher receivable in the passage to urge the staples towards the driveway and arranged to be moved out of the passage to permit entry of the staples into the passage through the opening.

12. A stapling appliance substantially as described with reference to the drawings accompanying the provisional specification.

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Agents for the Applicants.

PROVISIONAL SPECIFICATION

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We, GRYPMAK LIMITED, a British Company of Britannia Works, 28, Ashton Road, Luton, Bedfordshire, do hereby declare this invention to be described in the following statement:—

This invention relates to stapling appliances, particularly of the industrial type. Industrial stapling appliances are frequently employed in the furniture and allied trades where it is often necessary to drive staples at locations which can only be reached with difficulty. In such locations, a pointed ejector nozzle facilitates operation of the appliance but, even so, proper operation may be hindered by a staple magazine which projects from the nozzle and which may foul objects in the vicinity of the point at which the staple is to be driven. In such circumstances, it may be necessary to hold the appliance at an awkward angle to avoid the obstructing objects, to the detriment of the stapling operation.

To minimise this difficulty, the present invention provides a stapling appliance which is designed to be held in the hand and in which the staple magazine is adjustable relative to the handle of the appliance. The magazine may then be set at the start of an operation to avoid obstructing objects so that staples can be driven while the appliance is held in the hand in a convenient position.

The invention also provides a staple magazine which can be refilled with staples from the end distant from the ejecting mechanism, thereby reducing to a minimum the time wasted in refilling.

The invention will be more readily understood by way of example from the following description of a stapling appliance in accordance therewith, reference being made to the accompanying drawings in which

Figure 1 is a side view, partly in section of appliance, and

Figure 2 is a side view of the magazine, with the cover plate removed.

Referring to Figure 1, the stapling appliance is of pistol form and has a handle 12 designed to be gripped in the hand in the fashion of a pistol butt. In the upper part of

the handle there is formed a cylindrical hole 13 to receive the staple driving mechanism which is operated by compressed air supplied through a passage 14 in the handle 12 and controlled by a valve 15 operated by a trigger 16. A vent passage 17 is also provided in the handle 12.

The staple driving mechanism includes a generally cylindrical cover tube 18 which is cut away at its rear end to form a part 20 of reduced diameter and a shoulder 21. The part 20 is a close fit within hole 13, the shoulder 21 abutting against the forward end of the handle 12. The tube 18 is held in position by an end cap 22 which is screwed on to the threaded end of the part 20 until it engages the rear end of the handle 12.

The forward end of tube 18 is internally threaded at 23 and receives an externally threaded front end-cap 24, locked in position by a lock nut 25 which is screwed up until it engages the forward end of tube 18. The front end-cap 24 is integral with an elongated structure 26 which contains a length-wise staple drive way 40 (Figure 2) which extends from the forward end of the structure 26 and through the front end-cap 24. A staple drive-blade 27 is located in the drive way and when in its most forward position extends to the forward end of the guide-way. The rear end of blade 27 passes through the front end-cap 24 and is attached by a pin 28 to two segments 28a which are a press-fit within a hollow piston 29. Piston 29 is slidable within tube 18 and has on its exterior annular inserts 31 forming an air-tight seal between the piston 29 and the interior of tube 18. The interior of the tube 18 is reduced in diameter at the forward end by a tubular insert 32 within which is located a compression spring 33. This spring is mounted round blade 27 and abuts at its forward end against a plate 34 attached to end cap 24 and at rear end against a disc 35 secured to the blade 27.

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A large capacity staple magazine 37 is attached to structure 26. This magazine is of necessity of considerable length and, when the stapling appliance is in use, may make it difficult to apply the nose of the structure 26 to locations which have obstructing objects nearby, unless the appliance is held at an awkward angle. In order that the magazine may be set to avoid the obstructing objects, the tube 18 with the structure 26 and magazine 37 is rotatable in the handle 12. To adjust the tube 18 in this way, the rear end-cap 22 is slackened off, thereby permitting the tube to turn in hole 13. When the magazine 37 has been moved to the desired position relative to handle 12, the tube 18 is locked in position again by end-cap 22. As the passage 36 extends right round part 20, the staple ejection mechanism operates in satisfactory manner irrespective of its angular position in the handle 12.

Alternatively, the magazine may be adjusted by loosening lock nut 25 and turning the forward end-cap 24 in tube 18 until the desired angular position relative to handle 12 is reached.

The magazine 37 is shown in greater detail in Figure 2. Staples are held in a chamber 41 which is shaped according to the form of the staple to be used, i.e. when three leg staples are to be ejected the chamber is formed with three parallel and vertical slots to receive the legs horizontally. The structure 26 is provided with an opening permitting the topmost staple in the magazine to pass from chamber 41 into the guide way 40, and the chamber 41 extends downwardly to any opening at the bottom of the magazine.

The staples in chamber 41 are urged upwardly by a pusher 42 which has on each side a pin 43 projecting through a slot 44 in the sides of the magazine cover and which is attached to one end of a tension spring 45 which passes over a wheel 46 and is attached at the other end to the magazine cover at 47. The pin 43 has secured to it relatively large knobs 43a located outside the magazine cover and enabling the pusher to be manually moved along the slot 44. As shown in Figure 2, the slot 44 is parallel to the edge of the magazine for the major part of its length, but at the lower end has a part 48 extending sideways for a short distance. This sideways extending part 48 permits the pusher 42 to be moved sideways out of the chamber 41, thereby allowing a fresh bank of staples to be introduced into the chamber 41 from the lower end without the necessity of removing any part of the magazine. This arrangement of the pusher 42 reduces to a minimum the time required to replenish the magazine, when all the staples therein have been fired.

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PROVISIONAL SPECIFICATION

**This drawing is a reproduction of
the Original on a reduced scale.**

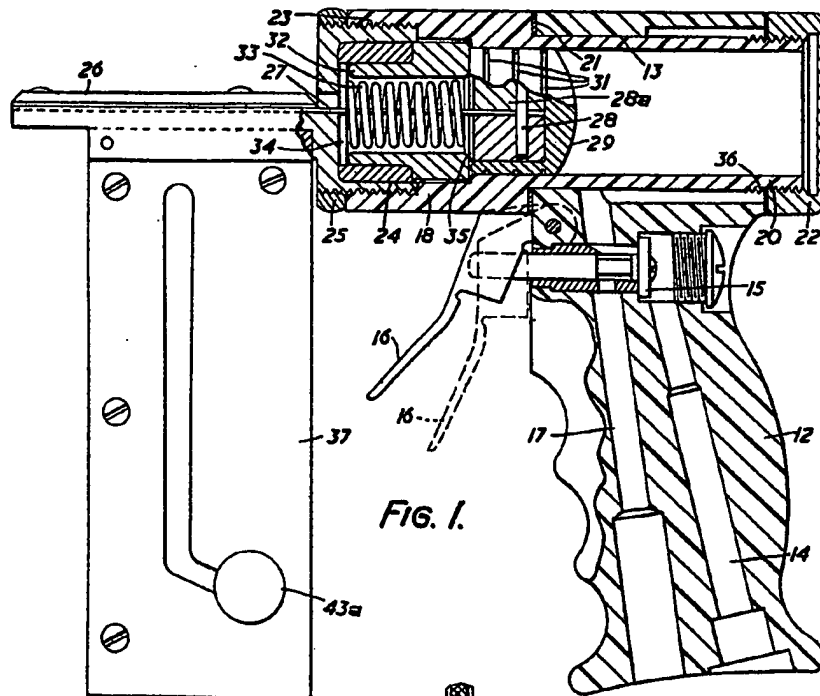


FIG. 1.

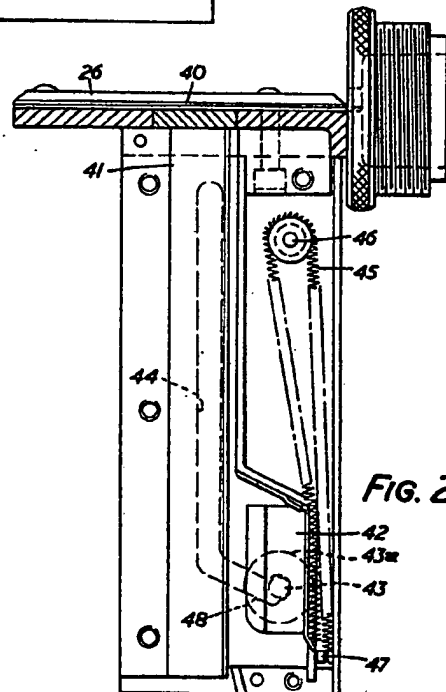


FIG. 2.